

WHAT IS CLAIMED IS:

1. A reclining apparatus comprising:

a fixed plate in which a first guide portion having a pair of mutually opposing guide walls and a second guide portion having a pair of mutually opposing guide walls are formed;

a shaft provided in the fixed plate so as to freely rotate around an axis in a horizontal direction;

a rotary plate relatively rotating around the shaft with respect to the fixed plate and in which an internal gear is formed along a circular arc around the shaft;

a first slide gear received between respective guide walls of the first guide portion and freely moving between a lock position engaged with the internal gear and a lock canceling position moving apart from the internal gear;

a second slide gear received between respective guide walls of the second guide portion and freely moving between a lock position engaged with the internal gear and a lock canceling position moving apart from the internal gear; and

a cam member provided between the first slide gear and the second slide gear and simultaneously driving the slide gears between the lock position and the lock canceling position,

wherein a supporting portion having an inclined surface preventing the slide gear from moving in a direction of a rotational moment applied to the slide gear due to a backward load applied to the seat back is provided in a portion in which the cam member and the slide gear oppose to each other.

2. A reclining apparatus as claimed in claim 1, wherein the cam member has a pair of hook portions engaging with receiving portions respectively formed in the first and second slide gears,

the hook portion and the receiving portion have a cam surface pressing the slide gear to the internal gear in a condition in which the cam member rotates in the direction of the lock position, and

the hook portion and the receiving portion are formed in a shape displacing the slide gear in an opposite direction to the rotational moment applied to the slide gear due to the backward load applied to the seat back when the cam member rotates in the lock canceling direction.

3. A reclining apparatus as claimed in claim 2, wherein the hook portion and the receiving portion are respectively provided near a center line of the slide gear in an area inside both side surfaces of the slide gear.

4. A reclining apparatus as claimed in claim 1, further comprising:
a bracket fixed to the fixed plate near the shaft; and
a spiral spring in which an inner peripheral end portion thereof is engaged with the bracket and an outer peripheral end portion thereof is engaged with the rotary plate so as to rotate the rotary plate in a direction that the seat back tilts forward,

wherein the bracket is provided with a vertical plate portion protruding out from an end surface of the fixed plate in an axial direction so as to engage with an inner peripheral side end portion of the spiral spring, and a bottom plate portion extending toward the shaft from an edge portion in the fixed plate side of the vertical plate portion, the bracket is fixed to the fixed plate by the bottom plate portion, and

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the vertical plate portion is formed in a substantially semicircular cylindrical shape around the shaft, a plurality of notches extending to the vertical plate portion and the bottom plate portion are formed in a crossing portion between the vertical plate portion and the bottom plate portion, and convex portions fitting into the notches are provided in the fixed plate.

5. A reclining apparatus as claimed in claim 4, wherein a pin protruding to the fixed plate side along an axial direction is provided in an outer peripheral portion of the rotary plate,

an outer peripheral side end portion of the spiral spring is engaged with the pin, a flange preventing the fixed plate from breaking away from the rotary plate is provided at a middle position between the spiral spring and the fixed plate in the pin, and

a stopper being brought into contact with the pin when the fixed plate and the rotary plate relatively rotate at a predetermined angle is provided in the outer peripheral portion of the fixed plate.

6. A reclining apparatus as claimed in claim 5, wherein in one of the fixed plate and the rotary plate, a linear protrusion being in slidable contact with another is provided all around the periphery of the shaft.

7. A reclining apparatus as claimed in claim 1, wherein

an urging member interposed between the fixed plate and the rotary plate and rotating the rotary plate in a direction in which the seat back tilts forward is provided, and

that a center of an engaging position between the first and second slide gears and the internal gear is arranged on a line vertically crossing a

line along a standard tilt angle of the seat back and passing through a center of rotation of the rotary plate.

8. A reclining apparatus as claimed in claim 1, wherein the reclining apparatus comprises:

a holding member provided in the fixed plate, rotatably supporting the rotary plate and preventing the rotary plate from breaking away from the fixed plate; and

an urging member interposed between the fixed plate and the rotary plate and rotating the rotary plate in a direction in which the seat back tilts forward, and

that the holding member is provided close to each of the slide gears and at least one by one in each of the slide gears, and at least a part of the portion holding the rotary plate of the holding member is located within a range of a width extending in an engaging direction of the slide gear.

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